NWS FORM E-19 (COVER)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE

REPORT ON RIVER GAGE STATION

REVISED, PRINTED DATES: 09/16/2011, 09/16/2011

LOCATION: Gardnerville
STREAM: East Fork Carson River
BASIN: Carson River HSA: REV

REFERENCES:

CA DWR Carson River Atlas, 12/1991
Correspondence w/Douglas Co. Office of Emergency Management
Correspondence w/Douglas Co. Public Works
Correspondence w/Douglas Co. Sheriff Office
NV Department of Conservation & Natural Resources: The Flood of 1997; 5/1997
NV Department of Conservation & Natural Resources; Carson River Chronology; 4/1997
NWS Cooperative Station Report (B44); GRDN2; 7/1/1967-12/30/2007
USCE January 1997 Flood Assessment; E Sierra/W NV Basins; 9/1997
USDA SCS; NV Dept. of Conservation & Natural Resources; CA Resources Agency:
Flood Chronology; Carson R Basin 1861-1976: 9/1977
USDA SCS; NV Dept of Conservation & Natural Resources; CA Resources Agency:
Water & Related Land Resources; Central Lahontan Basin: 7/1975
USDA SCS; NV Dept of Conservation & Natural Resources:
History of Flooding in the Carson Valley Watershed, 12/1852-6/1969; 11/1973
USGS Carters Station NV-CA 1:24,000 Scale Map
USGS Fact Sheet FS183-97, Flood of January 1997 in Carson River Basin; 12/1997
USGS Flood Frequency Analysis, 1890-2006; 9/14/2011
USGS Gaging Station Description, 2/7/2011
USGS Peak Flow Data, 1890-2010
USGS Smith Valley NV-CA 1:100,000 Scale Map; 1985
USGS Water Resources Data, 1890-2010

ABBREVIATIONS:

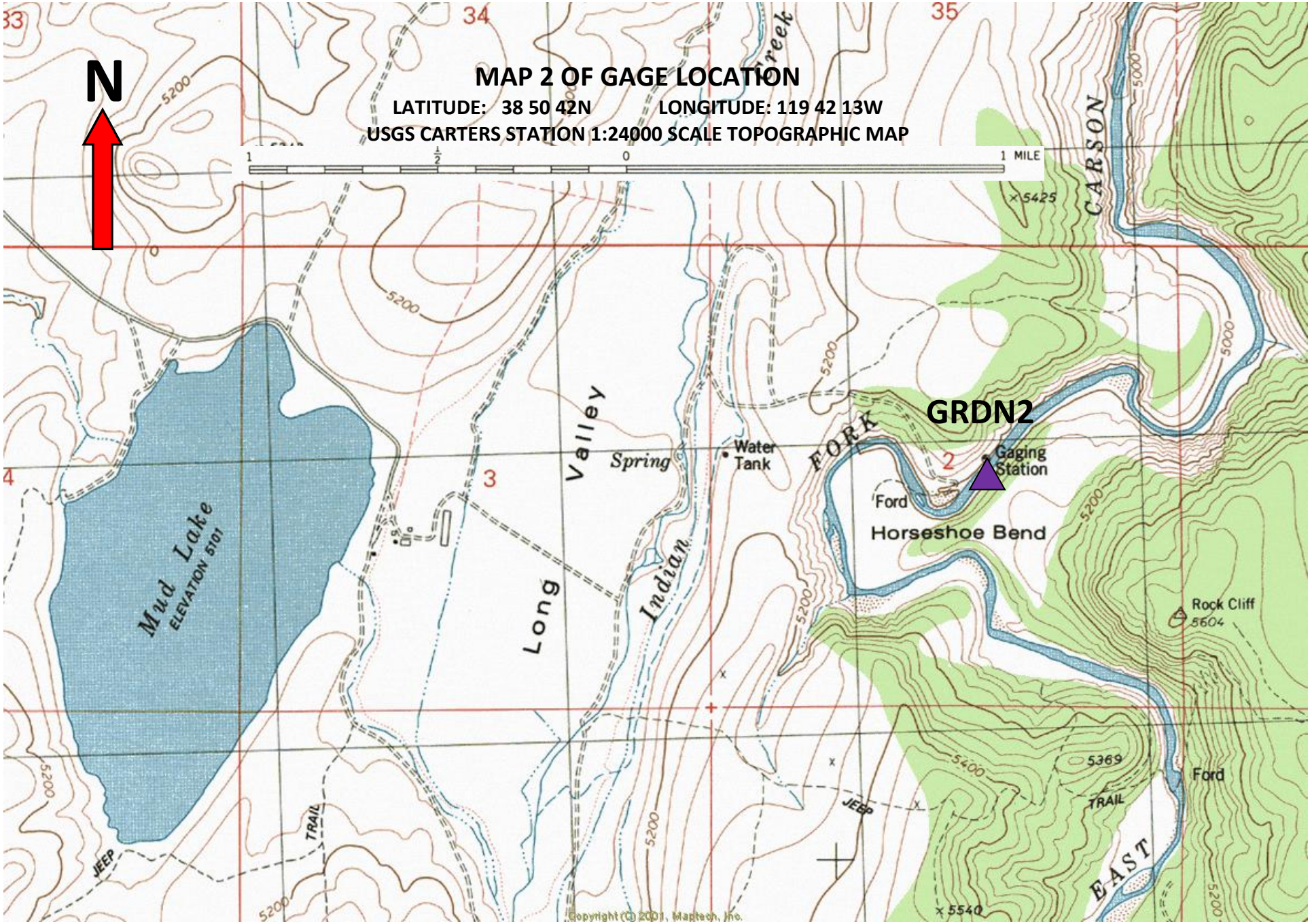
BM - bench mark	EPA - Environmental Protection Agency
DS - downstream	IBWC - International Boundary and Water Comm.
US - upstream	MSRC - Mississippi River Commission
HW - high water	MORC - Missouri River Commission
LW - low water	NOAA - National Oceanic and Atmospheric Admin.
RB - right bank	NOS - National Ocean Survey
LB - left bank	NWS - National Weather Service
MGL - mean gulf level	TVA - Tennessee Valley Authority
MLW - mean low water	USACE - U.S. Army Corps of Engineers
MSL - mean sea level	USBR - U.S. Bureau of Reclamation
MLT - mean low tide	USGS - U.S. Geological Survey
MT - mean tide	USWB - U.S. Weather Bureau
WQ - water quality	NGVD - National Geodetic Vertical Datum
RM - reference mark	NAD - North American Datum
RP - reference point	

LOCATION IDENTIFICATION: GRDN2
NWS INDEX NUMBER: 26-2984-01
USGS NUMBER: 10309000

MAP 1 OF GAGE LOCATION
Including locations of other USGS gages on the East Fork and Mainstem Carson River

LATITUDE: 38 50 42N LONGITUDE: 119 42 13W

Map Source: http://upload.wikimedia.org/wikipedia/commons/e/ec/Carsonrivermap.png


N
MAP 2 OF GAGE LOCATION
LATITUDE: 38 50 42N LONGITUDE: 119 42 13W
USGS CARTERS STATION 1:24000 SCALE TOPOGRAPHIC MAP
1 MILE
GRDN2
Gaging Station
Water Tank
Spring
Long Valley
Indian
FORK
CARSON
Mud Lake
ELEVATION 5101
Horseshoe Bend
Ford
Rock Cliff
5604
5369
5425
5540
TRAIL
JEEP
EAST
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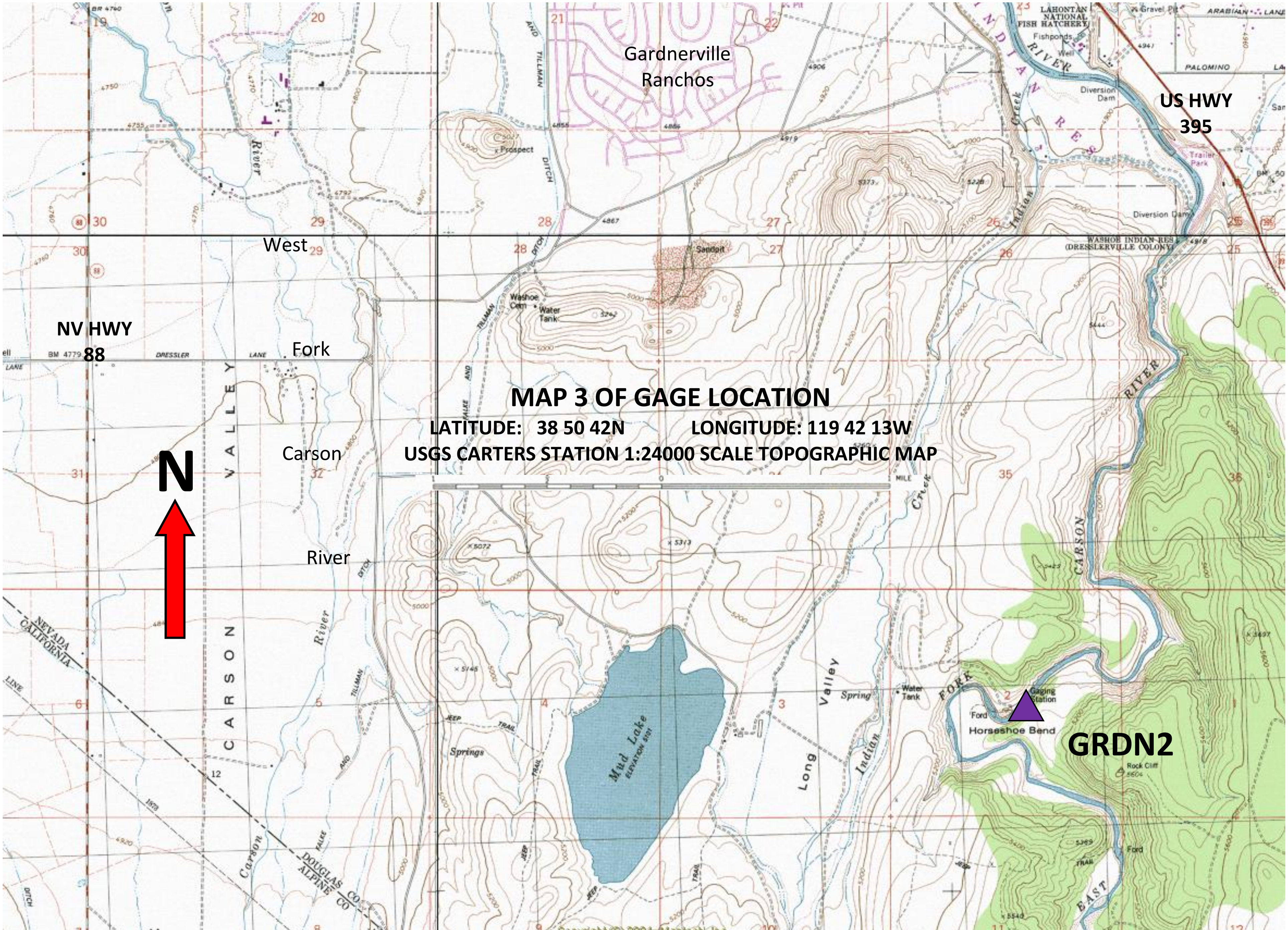
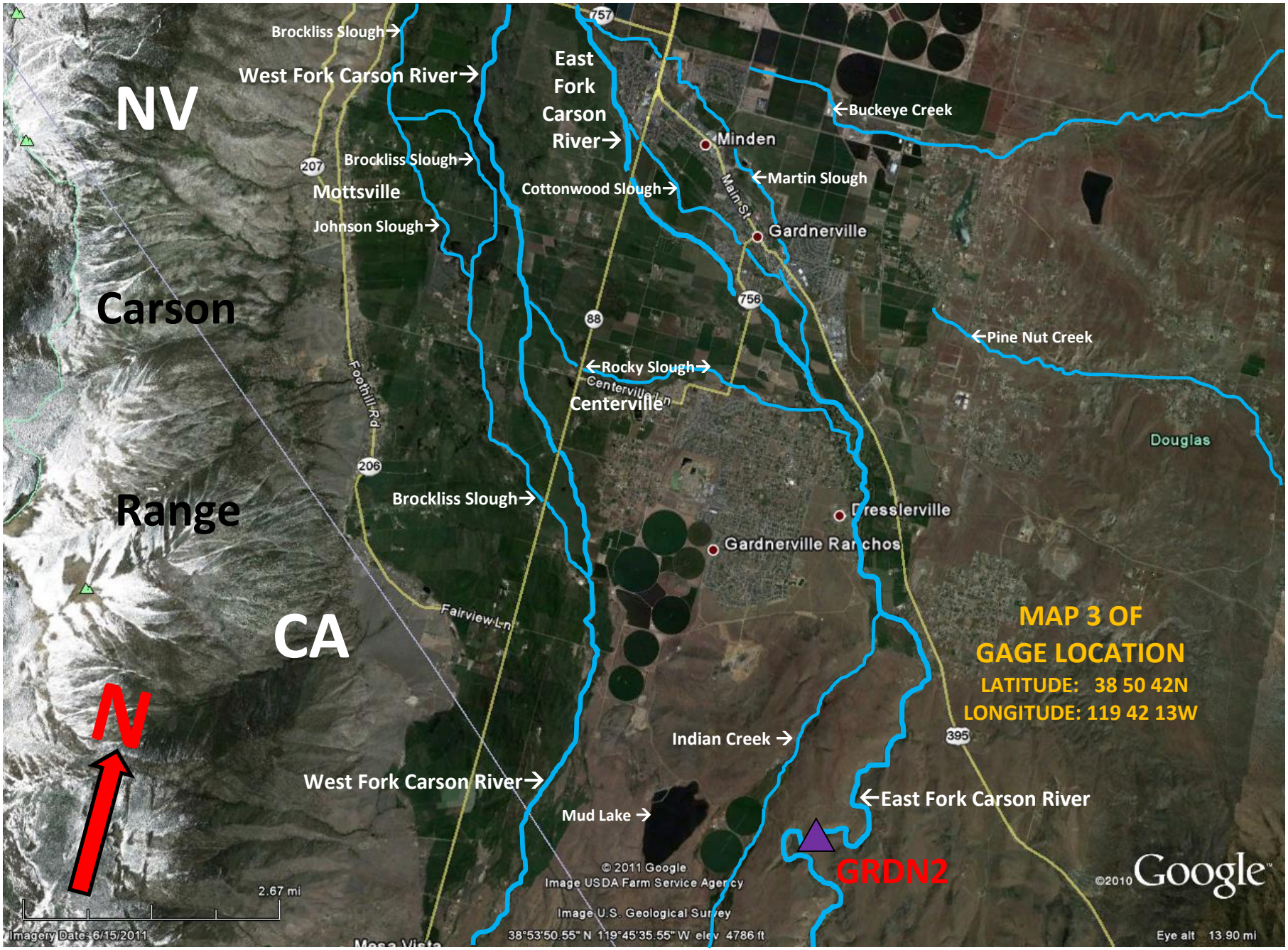

MAP 3 OF GAGE LOCATION
LATITUDE: 38 50 42N
LONGITUDE: 119 42 13W
USGS CARTERS STATION 1:24000 SCALE TOPOGRAPHIC MAP
N
Gardnerville
Ranchos
US HWY
395
NV HWY
88
West
Fork
Carson
River
GRDN2
Gaging Station
Horseshoe Bend
Mud Lake
CARSON VALLEY
CARSON RIVER
Long Valley
Indian Creek
NEVADA
CALIFORNIA
DOUGLAS CO
ALPINE CO
WASHOE INDIAN RES (DRESSLERVILLE COLONY)
LAHONTAN NATIONAL FISH HATCHERY
Copyright (C) 2004, Maptech, Inc.


NV
Carson
Range
CA
Brockliss Slough
West Fork Carson River
East Fork Carson River
Buckeye Creek
Minden
Martin Slough
Brockliss Slough
Mottsville
Cottonwood Slough
Johnson Slough
Gardnerville
Pine Nut Creek
Rocky Slough
Centerville
Douglas
Brockliss Slough
Dresslerville
Gardnerville Ranchos
MAP 3 OF
GAGE LOCATION
LATITUDE: 38 50 42N
LONGITUDE: 119 42 13W
Indian Creek
West Fork Carson River
East Fork Carson River
Mud Lake
GRDN2
N
2.67 mi
© 2011 Google
Image USDA Farm Service Agency
Image U.S. Geological Survey
38°53'50.55" N 119°45'35.55" W elev 4786 ft
Imagery Date: 6/15/2011
©2010 Google
Eye alt 13.90 mi

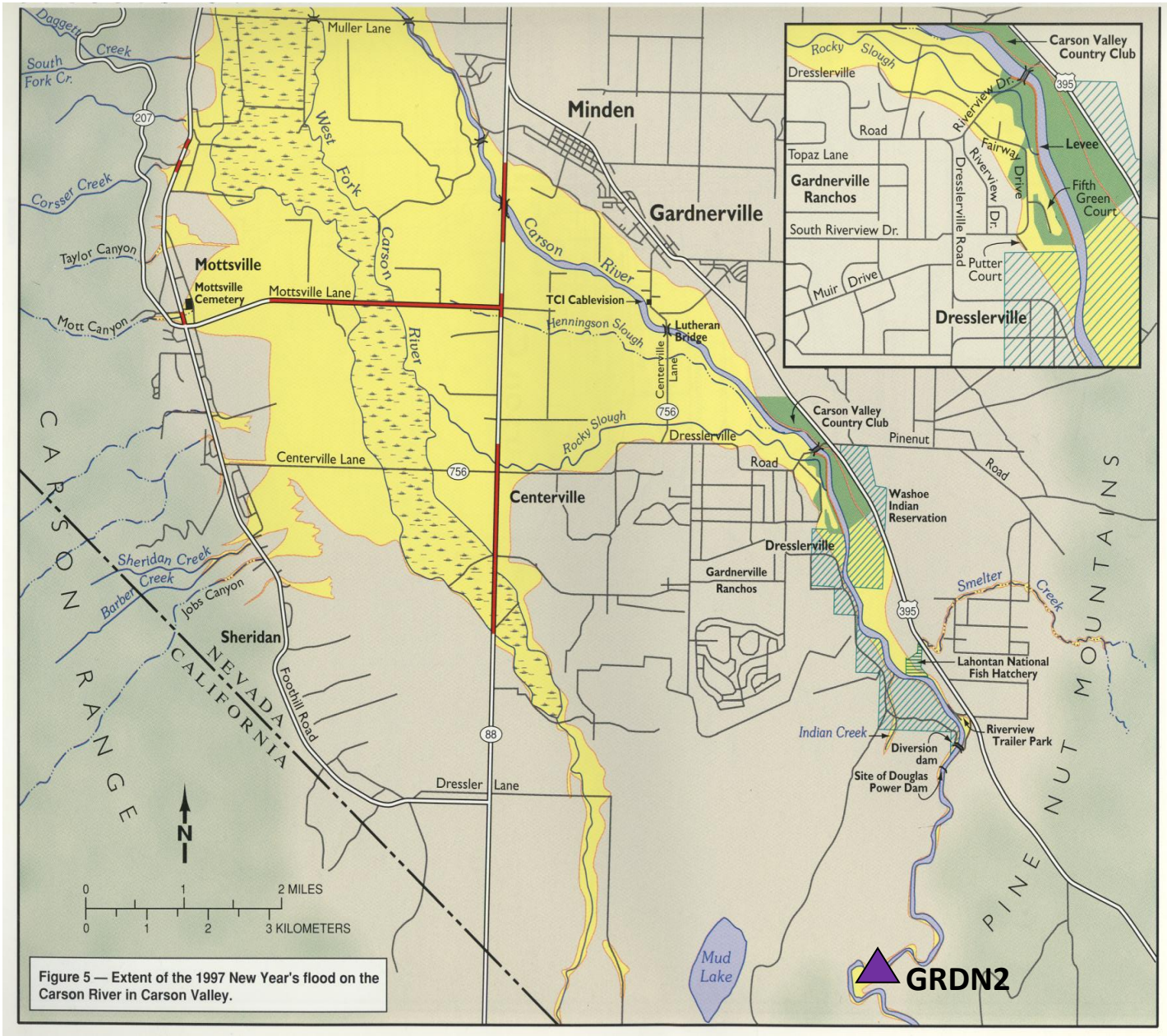
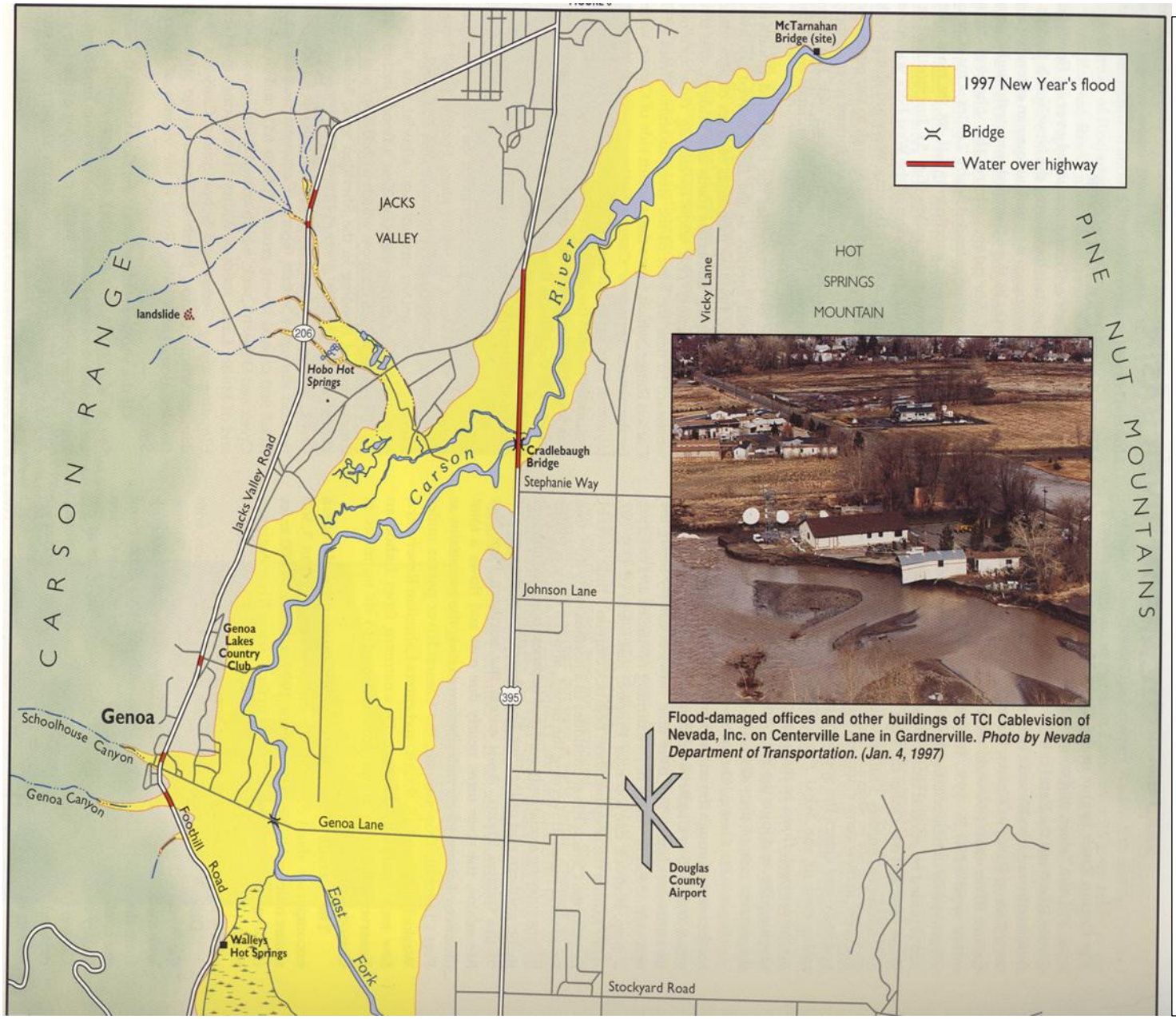


Figure 5 — Extent of the 1997 New Year's flood on the Carson River in Carson Valley.

Extent of the 1997 New Year's Flood in the southern Carson Valley. East Fork Carson R nr Gardnerville (GRDN2) crested at 20,300 cfs, which USGS estimated has a recurrence probability of about 1 in 150 any year. WOOC1 crested at 8,100 cfs, which has an estimated recurrence probability of about 1 in 300 any year (USGS, 2007). From: "The 1997 New Year's Floods in Western Nevada", NV Bureau of Mines and Geology Special Publication 23, 1998



Flood-damaged offices and other buildings of TCI Cablevision of Nevada, Inc. on Centerville Lane in Gardnerville. *Photo by Nevada Department of Transportation. (Jan. 4, 1997)*

Extent of the 1997 New Year's Flood in the northern Carson Valley. From: "The 1997 New Year's Floods in Western Nevada", NV Bureau of Mines and Geology Special Publication 23, 1998.

BENCHMARKS

ELEVATION OF GAGE ZERO: 4987.680 VERTICAL DATUM: NGVD 29
LEVELING AGENCY AND DATE: USGS CHECKBAR:
RATING AGENCY: USGS

BENCHMARK	DESCRIPTION	GAGE ZERO	DATUM
CSG	CSG pin attached to back of OSS near orifice line. Levels of 9/23/2009.	4.404	4992.084
OSS	Lag bolt in outside staff. Levels of 9/23/2009.	4.448	4992.128
RM10	Atop anchor bolt in SE corner of ADCP cableway concrete pad. Levels of 9/23/2009.	19.770	5007.450
RM11	Atop 5/8" rebar 10' E of ADCP cableway concrete pad. Levels of 9/23/2009.	17.920	5005.600
RM4	Top of 0.5" bolt head, on shoreward side of telephone pole, 55' US of old gage house. (Levels of 7/23/1993; elev. above gage datum.)	23.639	5011.319
RM7	Primary RM; atop rebar in 4" PVC pipe set in concrete on LB, 17' WNW of gage. Levels of 7/20/2001.	26.829	5014.509
RM8	Atop rebar in 4" PVC pipe set in concrete on LB, 81' W of gage. Levels of 9/23/2009.	25.042	5012.722
RM9	Atop rebar in 4" PVC pipe set in concrete on LB, 49' SW of gage. Levels of 9/23/2009.	16.877	5004.557
RP1	Atop 1" rebar attached to orifice line nearest cap. Levels of 9/23/2009.	3.653	4991.333
RP2	Atop 0.5" rebar 22' streamward of upper orifice. Levels of 9/23/2009.	6.775	4994.455
RP3	Atop 0.5" rebar 14' streamward of upper orifice. Levels of 9/6/2005.	7.216	4994.896
RP4	Atop 1" rebar attached to upper orifice. Levels of 9/23/2009.	9.590	4997.270
RP5	Lower lag bolt in staff plate post. Levels of 9/23/2009.	11.200	4998.880
RP6	Upper lag bolt in staff plate post. Levels of 9/23/2009.	13.514	5001.194

GAGES

DCP

NESS ID: DD99C4D4
OWNER: USGS
REPORT TIME: 00:40:30
INTERVAL: 60

TELEM

TYPE OF TELEMETRY: LARC
OWNER: NWS
PHONE NUMBER:
INTERVAL: UNK
PAYOR/COST OF LINE: Assoc / $

GAGE TYPE	OWNER	MAINTENANCE	BEGAN	ENDED	GAGE LOCATION/REMARKS
STAFF	USGS	USGS	04/06/1890	12/31/1893	2 mi DS of 1939-present site, 1/2 mi SW of Rodenbah's Ranch, about 300' DS of Douglas Milling & Power Co. Ruhenstroth dam site, different datum.
STAFF	USGS	USGS	10/17/1900	12/31/1906	2 mi DS of 1939-present site, 1/2 mi SW of Rodenbah's Ranch, about 300' DS of Douglas Milling & Power Co. Ruhenstroth dam site, different datum.
STAFF	USGS	USGS	01/05/1908	12/26/1910	0.5 mi. US of 1939-present site; near center of Horseshoe Bend; different datum.
STAFF	USGS	USGS	06/22/1917	10/31/1917	2 mi DS of 1939-present site, 1/2 mi SW of Rodenbah's Ranch, about 300' DS of Douglas Milling & Power Co. Ruhenstroth dam site, different datum.
STAFF	USGS	USGS	12/17/1924	09/30/1928	2 mi DS of 1939-present site, 1/2 mi SW of Rodenbah's Ranch, about 300' DS of Douglas Milling & Power Co. Ruhenstroth dam site, different datum.
RECORDER	State DWR	State DWR	06/01/1928	09/30/1928	2 mi DS of 1939-present site, 1/2 mi SW of Rodenbah's Ranch, about 300' DS of Douglas Milling & Power Co. Ruhenstroth dam site, different datum.
STAFF	USGS	USGS	06/10/1929	09/23/1929	2 mi DS of 1939-present site, 1/2 mi SW of Rodenbah's Ranch, about 300' DS of Douglas Milling & Power Co. Ruhenstroth dam site, different datum.
STAFF	USGS	USGS	10/01/1935	12/10/1937	2 mi. DS of '39-present site; 0.5 mi. SW of Rodebah's Ranch; 300' DS of Douglas Milling & Power Co. damsite; different datum.
FLOAT	USGS	USGS	05/19/1939	07/20/2001	Inside well, same location as IS STAFF, referenced to IS STAFF. Drives recorder and telemetry devices (via shaft encoder).
IS STAFF	USGS	USGS	05/19/1939	07/20/2001	On LB, 0.1 mi DS Horseshoe Bend, 2 mi E Mud Lk Resv., 4.5 mi. DS Bryant Ck, 7 mi SE Gardnerville. Range: 0'-6.74'; On 2x6 plank in well. Reference gage.
RECORDER	USGS	USGS	05/19/1939	07/20/2001	In well house, same loc. as IS STAFF, referenced to IS STAFF. Driven by float tape (CR10 driven by shaft encoder). Types: Stevens A35 ('39-'60s), FP ADR (60s-'94); Campbell Scientific CR10 (1994-2001).
OS STAFF	USGS	USGS	05/19/1939	07/20/2001	On LB, 0.1 mi DS Horseshoe Bend, 2E Mud Lk Resv., 4.5 DS Bryant Ck, 7SE Gardnerville. Range: 3.34'-6.64'; On 2x6 plank outside of well house.
TEMP GAGE	USGS	USGS	05/14/1953	01/03/1997	Temperature gage, in well house, same location as IS STAFF; probe in well intake pipe.
BDT/DCD	NWS	NWS	06/29/1967	05/30/1989	In well house, same location as IS STAFF, referenced to Inside staff. Driven by float tape.
LARC	NWS	NWS	05/30/1989		In well 5/30/89-7/20/01, same location as IS STAFF; Referenced to inside staff. Model Handar 550A. Driven by shaft encoder(Handar 436A). After 7/20/01 at location 300' US in gagehouse. Driven by PS2 Pressure Transducer, set to agree w/OS Staff.
SHAFT	NWS	NWS	05/30/1989	07/20/2001	Shaft encoder, in well house, same location as IS STAFF; driven by float tape. Model HANDAR 436A. Drives USGS Campbell Scientific CR10 Recorder & NWS LARC.
CREST STAG	USGS	USGS	07/20/2001		In channel, attached to 6x6 w/staff nr end of orifice line. 0.1 mi DS Horseshoe Bend, 2E Mud Lk Resv., 4.5 DS Bryant Ck, 7SE Gardnerville. 300' US of former (1939-2001) location.
DCP	USGS	USGS	07/20/2001		In gagehouse, on LB, 0.1 mi DS Horseshoe Bend, 2E Mud Lk Resv., 4.5 DS Bryant Ck, 7SE Gardnerville.
PS2	USGS	USGS	07/20/2001		PS2 Pressure Transducer (SDI12), in gage house, on LB, 0.1 mi DS Horseshoe Bend, 2E Mud Lk Resv., 4.5 DS Bryant Ck, 7SE Gardnerville. Set to agree w/OS staff.
RECORDER	USGS	USGS	07/20/2001		SATLINK 2 Recorder; on LB, 0.1 mi DS Horseshoe Bend, 2E Mud Lk Resv., 4.5 DS Bryant Ck, 7SE Gardnerville.
STAFF	USGS	USGS	07/20/2001		On LB, 0.1 mi DS Horseshoe Bend, 2E Mud Lk Resv., 4.5 DS Bryant Ck, 7SE Gardnerville. On 6X6 with CSG nr end of orifice line in channel. 300' US of former (1939-2001) location.

HISTORY

PUBLICATION/LOCATION OF RECORDS	STARTING DATE	ENDING DATE

TYPE OF GAGE	OWNER	STARTING DATE	ENDING DATE
STAFF	USGS	04/06/1890	12/31/1893
STAFF	USGS	10/17/1900	12/31/1906
STAFF	USGS	01/05/1908	12/26/1910
STAFF	USGS	06/22/1917	10/31/1917
STAFF	USGS	12/17/1924	09/30/1928
RECORDER	State DWR	06/01/1928	09/30/1928
STAFF	USGS	06/10/1929	09/23/1929
STAFF	USGS	10/01/1935	12/10/1937
FLOAT	USGS	05/19/1939	07/20/2001
IS STAFF	USGS	05/19/1939	07/20/2001
RECORDER	USGS	05/19/1939	07/20/2001
OS STAFF	USGS	05/19/1939	07/20/2001
TEMP GAGE	USGS	05/14/1953	01/03/1997
BDT/DCD	NWS	06/29/1967	05/30/1989
LARC	NWS	05/30/1989	
SHAFT ENCODER	NWS	05/30/1989	07/20/2001
CREST STAGE	USGS	07/20/2001	
DCP	USGS	07/20/2001	
PS2	USGS	07/20/2001	
RECORDER	USGS	07/20/2001	
STAFF	USGS	07/20/2001	

ZERO ELEVATION	STARTING DATE
4985.110	05/19/1939
4987.680	07/20/2001

CRESTS*

FLOOD STAGE: 9.50 ACTION STAGE: 7.00 FLOOD FLOW: 7450 ACTION FLOW: 3170

***ONLY ANNUAL WATER YEAR CRESTS GREATER THAN 2750 CFS LISTED BELOW**

DATE OF CREST	TIME LST	CREST (ft)	FLOW (CFS)	FROM HIGH WATERMARKS	BASED ON OLD DATUM	CAUSED BY ICE JAM	REMARKS
05/28/1890	UNDEF	7.69	4260				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD DATUM NA.
12/25/1892	UNDEF	8.47	5540				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD DATUM NA.
05/17/1901	UNDEF	7.33	3162				CREST STG CALCULATED USNG RT14 (7/20/01). ACTUAL CREST @ OLD DATUM NA.
05/14/1903	UNDEF	6.69	2850				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION NA.
02/24/1904	UNDEF	7.58	4100				ACTUAL CREST @ OLD DATUM NA. CREST STG CALCULATED USNG RT16 (9/8/2011).
06/05/1909	UNDEF	7.65	4200				ACTUAL CREST @ OLD DATUM NA. CREST STG CALCULATED USNG RT16 (9/8/2011).
05/06/1925	UNDEF	7.07	3350				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 4.00'.
05/17/1927	UNDEF	6.92	3150				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION NA.
12/11/1937	UNDEF	10.85	10300				ACTUAL CREST @ OLD DATUM NA. CREST STG CALCULATED USNG RT16 (9/8/2011).
12/03/1941	UNDEF	7.56	4060				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD DATUM 6.00'.
01/21/1943	UNDEF	8.40	5420				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 6.86'.
02/02/1945	UNDEF	7.17	3490				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 5.57'.
11/21/1950	UNDEF	11.57	12100				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 9.66'.
06/06/1952	UNDEF	7.21	3560				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 5.40'.
03/09/1954	UNDEF	6.59	2730				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 4.65'.
12/23/1955	UNDEF	13.62	17600				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 11.88'
05/19/1958	UNDEF	6.93	3160				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 5.01'.
02/01/1963	UNDEF	12.10	13400				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 10.45'.
12/23/1964	UNDEF	9.89	8230				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 8.13'.
05/24/1967	UNDEF	7.58	4100				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 5.58'.
05/27/1969	UNDEF	7.31	3700				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 5.34'.
01/16/1970	UNDEF	6.85	3060				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 4.85'.
05/19/1973	UNDEF	6.79	2980				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 4.80'.
11/12/1973	UNDEF	6.99	3250				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 4.97'.
06/12/1975	UNDEF	7.00	3260				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 5.01'.
01/11/1979	UNDEF	6.60	2740				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 4.56'.
01/13/1980	UNDEF	9.73	7910				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 7.78'.
02/16/1982	UNDEF	8.90	6310				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 6.95'.
05/29/1983	UNDEF	9.63	7700				ACTUAL CREST STG NA. CREST STG CALC W/RT16(9/8/2011).
11/24/1983	UNDEF	7.54	3430				CREST STG CALCULATED USNG RT14 (7/20/01). ACTUAL CREST @ OLD LOCATION 5.09'.
02/19/1986	UNDEF	9.47	7380				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 7.52'.
03/10/1995	UNDEF	8.70	5930				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 6.75'.
05/16/1996	UNDEF	9.30	7060				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL CREST @ OLD LOCATION 7.41'.
01/03/1997	UNDEF	14.50	20300				CREST STG CALCULATED W/RT16 (9/8/2011). MEASURED CREST @ OLD LOCATION 13.00'.
03/24/1998	UNDEF	6.64	2970				CREST STG CALCULATED W/RT16 (9/8/2011). MEASURED CREST @ OLD LOCATION 4.70'.
05/29/1999	UNDEF	6.92	3150				CREST STG CALCULATED W/RT16 (9/8/2011). MEASURED CREST @ OLD LOCATION 4.84'.
05/30/2003	UNDEF	6.93	3170				CREST STG CALCULATED W/RT16 (9/8/2011). MEASURED CREST 7.33'.
05/16/2005	UNDEF	7.84	4500				CREST STG CALCULATED W/RT16 (9/8/2011). MEASURED CREST 7.77'
12/31/2005	UNDEF	10.58	9730				CREST STG CALCULATED W/USGS RT16 (9/8/2011). MEASURED CREST 11.05'
06/06/2010	UNDEF	7.44	3890				CREST STG CALCULATED USNG RT16 (9/8/2011). ACTUAL MEASURED CREST 7.36'.

LOW WATER RECORDS*

***ONLY ANNUAL MINIMUM FLOWS LESS THAN 30 CFS LISTED BELOW**

DATE OF LOW WATER	STAGE (ft)	FLOW (CFS)	REMARKS
09/04/1977	2.81	11	Also 9/5-8/77; Mean daily flow; Stg est. w/RTG16
11/20/1977	2.74	7	Mean daily flow; Stage est. w/RTG 16.
09/14/1987	2.95	28	Mean daily Q; Stg est. w/RTG16
09/09/1988	2.87	17	Also 9/11-13/88; Mean daily flow; Stg est w/Rtg16
10/04/1988	2.92	24	Mean daily flow; stage est. w/RTG16
09/13/1990	2.96	30	Also 9/16/90; Mean daily Q; stg est w/RTG16
09/24/1992	2.95	29	Mean daily flow; stage est. w/RTG16
12/25/1992	2.94	27	Mean daily flow; stage est. w/RTG16
09/10/1994	2.91	23	Mean daily flow; stage est. w/RTG16
09/09/2001	2.95	29	Mean daily flow; stage est. w/RTG16
10/17/2001	2.94	27	Mean daily flow; stage est. w/RTG16
10/04/2007	2.95	29	Also 12/2/2007; Mean daily flow; stage est. w/RTG16

CONDITIONS AFFECTING FLOW

MILES ABOVE MOUTH: DRAINAGE AREA: 356.0 POOL STAGE:

STREAM BED: Sand, gravel, rocks; quite permanent.

REACH: Bryant Ck (4.5 mi.US) to conf. w/W Fk Carson @ Genoa (~15mi.DS)

REGULATION: Slight regulation by several small upstream reservoirs, total capacity, about 5000 AF.

DIVERSION: Some above station for irrigation. Above all Carson Valley diversions.

WINTER: Gage subject to ice effect.

TOPOGRAPHY: In gorge 45-70' deep. Hills all quads. Both banks high, steep, rocky; covered w/pines, sage. One channel all stages; straight. No overflow possible @ gage, little erosion. Horseshoe Bend 800' US.

REMARKS: LO WTR RCD & CREST RECORD: Stages obtained by converting Q to stg using USGS RT #16 (9/8/2011). Only annual maximum flows >2750 cfs and minimum flows <30 cfs used.

***FLOOD INFO**: Old river channels (sloughs) fill rapidly during periods of high flow, causing extensive flooding across valley. At high flows, river cuts new channels, w/extensive damage.*

DAMAGE

STAGE	AREAS AFFECTED
6.50	No flooding on the East Fork Carson River. At about 2600 cfs, USGS estimates that this much flow has about a one in 2 chance of occurring any year.
7.00	Monitoring stage...no flooding. Residents along the river should prepare for flooding if additional rises due to snowmelt and/or rainfall runoff occur. Flood prone areas include Washoe Indian Reservation...Carson Valley Country Club...Glenwood Dr...Riverview Dr...Centerville Rd...NV Hwy 88...Westwood Village...Rocky Slough...Dresslerville Rd...Waterloo and Mottsville Lanes. At about 3250 cfs...USGS estimates that this much flow has about a one in 3 chance of occurring any year.
7.50	Channel capacity of East Fork Carson River...no flooding. Residents along the river should prepare for flooding if additional rises due to snowmelt and/or rainfall runoff occur. Flood prone areas include Washoe Indian Reservation...Carson Valley Country Club...Glenwood Dr...Riverview Dr...Centerville Rd...NV Hwy 88...Westwood Village...Rocky Slough...Dresslerville Rd...Waterloo and Mottsville Lanes. At about 4000 cfs...USGS estimates that this much flow has about a one in 4 chance of occurring any year.
8.00	Lowest portions of Carson Valley begin to have flood threat. The most flood prone areas include the Washoe Indian Reservation...Carson Valley Country Club...Glenwood Drive...Riverview Drive...Centerville Road...NV Hwy 88...Westwood Village...Rocky Slough...Dresslerville Road...Waterloo and Mottsville Lanes. At about 4750 cfs...the USGS estimates that this much flow has about a one in 5 chance of being exceeded any year.
8.50	Minor lowland flooding begins in lowest portions of Carson Valley. Flood prone areas include the Washoe Indian Reservation...Carson Valley Country Club...Glenwood Drive...Riverview Drive...Centerville Road...NV Hwy 88...Westwood Village...Rocky Slough...Dresslerville Road...Waterloo and Mottsville Lanes. At about 5600 cfs...the USGS estimates that this much flow has about a one in 7 chance of being exceeded any year.
9.00	Minor lowland flooding in lowest portions of Carson Valley. Flood prone areas include the Washoe Indian Reservation...Carson Valley Country Club...Glenwood Drive...Riverview Drive...Centerville Road...NV Hwy 88...Westwood Village...Rocky Slough...Dresslerville Road...Waterloo and Mottsville Lanes. At about 6500 cfs...the USGS estimates that this much flow has about a one in 10 chance of being exceeded any year.
9.50	Flood stage. Minor lowland flooding in Carson Valley. Low-lying roads...bridges...drainage structures sustain minor damage. Cottonwood Slough begins to flood Lampe Park. Flood prone areas include Washoe Indian Reservation...Carson Valley Country Club...Glenwood Dr...Riverview Dr...Centerville Rd...NV Hwy 88...Westwood Village...Rocky Slough...Waterloo and Mottsville Lanes. About 7450 cfs...similar to 2/19/1986 flood. USGS estimates there is about a one in 12 chance of this flow being exceeded any year.
10.00	Minor flooding in Carson Valley with some homes...roads and bridges in lower portions of Minden...Gardnerville...Centerville...Washoe Indian Reservation and Genoa flooded. At about 8500 cfs...similar to 12/23/1964 flood. USGS estimates that this much flow has about a one in 15 chance of being exceeded any year.
10.50	Moderate flood damage in Carson Valley area. Flooding of homes...businesses...schools...roads and bridges in lower portions of Minden...Gardnerville...Centerville...Genoa and Washoe Indian Reservation. Transportation...communication...water and power systems begin to be affected. At about 9550 cfs...similar to 12/31/2005 flood. USGS estimates that this much flow has about a one in 20 chance of being exceeded any year.
11.00	Moderate flooding in Carson Valley. Homes...businesses...schools...roads and bridges in lower portions of Minden...Gardnerville...Centerville...Genoa and Washoe Indian Reservation flood. Moderate flood effects to transportation...communication...water and power systems. At about 10700 cfs...USGS estimates that this much flow has about a one in 25 chance of being exceeded any year.
11.50	Major flooding in Carson Valley with significant damage. East Fork Carson River feeds Rocky...Cottonwood...Martin and Henningson Sloughs which flood portions of Minden/Gardnerville downtown areas...causing damage to homes...businesses...schools...roads and bridges. Transportation... communication...water and power systems significantly affected. About 11900 cfs...similar to 11/21/1950 flood. USGS estimates that this much flow has about a one in 35 chance of being exceeded any year.
12.00	Major flooding in Carson Valley with significant damage. The East Fork Carson River feeds Rocky...Cottonwood...Martin...and Henningson Sloughs which flood portions of Minden/Gardnerville downtown areas...causing damage to homes...businesses...schools...roads and bridges. Major effects to transportation...communication...water and power systems. At about 13200 cfs...similar to 2/1/1963 flood. USGS estimates that this much flow has about a one in 45 chance of being exceeded any year.
12.50	Major flooding with much of lower Carson Valley flooded...including portions of Minden...Gardnerville...Centerville and Genoa. Significant damage to homes...businesses...schools...roads and bridges. Transportation...communication ...water and power systems severely affected. US Hwy 395 closed. At about 14500 cfs...similar to 2/1/1963 flood. USGS estimates that this much flow has about a one in 55 chance of being exceeded any year.

DAMAGE

STAGE	AREAS AFFECTED
13.00	Much of the lower Carson Valley is flooded...including portions of Minden...Gardnerville...Centerville and Genoa. Widespread damage to homes...schools...businesses...roads and bridges. Transportation...communication...water and power systems affected. US Hwy 395 closed. At about 15800 cfs...worse than 2/1/1963 flood. USGS estimates this much flow has about a one in 70 chance of being exceeded any year.
13.50	Widespread flood damage in Carson Valley...including Minden/Gardnerville/Genoa/Centerville. Extensive damage to homes...businesses...schools...roads and bridges. Transportation...communication...water and power systems severely affected. Massive bank and channel erosion at these flows is capable of sweeping away buildings...roads and vehicles. At about 17300 cfs...similar to 12/23/1955 flood. USGS estimates that this much flow has about a one in 90 chance of being exceeded any year.
14.00	Disastrous flooding throughout Carson Valley including Minden/Gardnerville/Genoa/Centerville. Extensive damage to homes...businesses...schools ...roads and bridges. Transportation... communication...water and power systems severely affected. Massive bank and channel erosion...capable of sweeping away buildings...roads and vehicles. At about 18800 cfs...not as severe as 1/3/1997 flood...but worse than 12/23/1955 flood. About a one in 100 chance of being exceeded any year per USGS estimates.
14.50	Near record flooding...like 1/3/1997 flood. All roads in/out of Carson Valley flooded including Minden/Gardnerville/Genoa. Extensive damage to homes...businesses...schools...roads... bridges. Transportation...communication...water and power systems severely affected. Massive bank and channel erosion...capable of sweeping away buildings...roads...vehicles. 10 by 2 mile portion of Carson Valley underwater. About 20000 CFS...about a one in 125 chance of being exceeded any year per USGS estimates.
15.00	Record flooding with widespread flooding of homes...businesses...schools..levees..roads...bridges through Carson Valley...including Minden/Gardnerville/Genoa/Centerville/Dresslerville. Transportation... communication...water...power systems severely affected. Carson Valley isolated...major highways are flooded. A 12 by 3 mile portion of Carson Valley in Douglas County is underwater. Severe channel bank erosion. At about 22000 cfs...about a one in 175 chance of being exceeded any year per USGS estimates.
15.50	Record flooding. Widespread flooding of homes...businesses...schools...levees...roads...bridges through Carson Valley...including Minden/Gardnerville/Genoa/Centerville/Dresslerville. Transportation... communication...water and power systems severely affected. Carson Valley isolated...major highways are flooded. A 12 by 3 mile portion of Carson Valley in Douglas County is underwater. Severe channel bank erosion. At over 23000 cfs...about a one in 200 chance of being exceeded any year per USGS estimates.
16.00	Record flooding. Widespread flooding of homes...businesses...schools...levees...roads...bridges through Carson Valley...including Minden/Gardnerville/Genoa/Centerville/Dresslerville. Transportation... communication...water and power systems severely affected. Carson Valley isolated...major highways are flooded. A 14 by 4 mile portion of Carson Valley in Douglas County is underwater. Severe channel bank erosion. At over 25000 cfs...about a one in 250 chance of being exceeded any year per USGS estimates.

RIVER STAGE DATA

	21-		
	19-		
	17-		
16.00 - Record flooding. Widespread flooding of homes...businesses...schools...levees...roads...bridges through Carson Valley...including Minden/Gardnerville/Genoa/Centerville/Dresslerville. Transportation... communication...water and power systems severely affected. Carson Valley isolated...major highways are flooded. A 14 by 4 mile portion of Carson Valley in Douglas County is underwater. Severe channel bank erosion. At over 25000 cfs...about a one in 250 chance of being exceeded any year per USGS estimates.	15-	14.50	01/03/1997
		13.62	12/23/1955
15.50 - Record flooding. Widespread flooding of homes...businesses...schools...levees...roads...bridges through Carson Valley...including Minden/Gardnerville/Genoa/Centerville/Dresslerville. Transportation... communication...water and power systems severely affected. Carson Valley isolated...major highways are flooded. A 12 by 3 mile portion of Carson Valley in Douglas County is underwater. Severe channel bank erosion. At over 23000 cfs...about a one in 200 chance of being exceeded any year per USGS estimates.	13-	12.10	02/01/1963
		11.57	11/21/1950
	11-	10.85	12/11/1937
15.00 - Record flooding with widespread flooding of homes...businesses...schools..levees..roads...bridges through Carson Valley...including Minden/Gardnerville/Genoa/Centerville/Dresslerville. Transportation... communication...water...power systems severely affected. Carson Valley isolated...major highways are flooded. A 12 by 3 mile portion of Carson Valley in Douglas County is underwater. Severe channel bank erosion. At about 22000 cfs...about a one in 175 chance of being exceeded any year per USGS estimates.		10.58	12/31/2005
		9.89	12/23/1964
		9.73	01/13/1980
	9-	9.30	05/16/1996
		8.90	02/16/1982
		8.47	12/25/1892
		7.84	05/16/2005
14.50 - Near record flooding...like 1/3/1997 flood. All roads in/out of Carson Valley flooded including Minden/Gardnerville/Genoa. Extensive damage to homes...businesses...schools...roads... bridges. Transportation...communication...water and power systems severely affected. Massive bank and channel erosion...capable of sweeping away buildings...roads...vehicles. 10 by 2 mile portion of Carson Valley underwater. About 20000 CFS...about a one in 125 chance of being exceeded any year per USGS estimates.		7.69	05/28/1890
	7-	7.33	05/17/1901
		7.00	06/12/1975
		6.60	01/11/1979
	5-		
14.00 - Disastrous flooding throughout Carson Valley including Minden/Gardnerville/Genoa/Centerville. Extensive damage to homes...businesses...schools ...roads and bridges. Transportation... communication...water and power systems severely affected. Massive bank and channel erosion...capable of sweeping away buildings...roads and vehicles. At about 18800 cfs ...not as severe as 1/3/1997 flood...but worse than 12/23/1955 flood. About a one in 100 chance of being exceeded any year per USGS estimates.			
13.50 Widespread flood damage in Carson Valley...including Minden/Gardnerville/Genoa/Centerville. Extensive damage to homes...businesses...schools...roads and bridges. Transportation...communication...water and power systems severely affected. Massive bank and channel erosion at these flows is capable of sweeping away buildings...roads and vehicles. At about 17300 cfs...similar to 12/23/1955 flood. USGS estimates that this much flow has about a one in 90 chance of being exceeded any year.			
13.00 Much of the lower Carson Valley is flooded...including portions of Minden...Gardnerville...Centerville and Genoa. Widespread damage to homes...schools...businesses...roads and bridges. Transportation...communication...water and power systems affected. US Hwy 395 closed. At about 15800 cfs...worse than 2/1/1963 flood. USGS estimates this much flow has about a one in 70 chance of being exceeded any year.			

REACH: Bryant Ck (4.5 mi.US) to conf. w/W Fk Carson @ Genoa (~15mi.DS) ELEVATION ZERO: 4987.68

CONTACTS

SQ	CONTACT/REMARKS	PHONE
1	USGS WRD-Carson City NV snberris@usgs.gov, mgipson@usgs.gov USGS responsible for gage maintenance (except LARC). Stephen Berris is USGS NV Data Chief. Marsha Gipson is Carson City field office chief (887-7626). Jim Swartwood (887-7682) & Jim Crompton (887-7681) can also assist.	775-887-7693
2	US Water Master cblanchard@uswatermaster.org Chief Deputy Water Master Chad Blanchard in Reno uses gage data for flood & water supply mgt.	775-784-5241
3	Julian Larrouy Deputy Water Master for Carson River Basin above Lahontan. Very knowledgeable of flow/damage relationships on Carson River.	
4	Douglas Co. S.O. rpierini@earthlinklnet Ron Pierini is Douglas Co. Sheriff. Closely monitors E Fk Carson River as has high impact on flooding in Minden/Gardnerville. Douglas S.O. can provide info about current flood conditions & effects.	775-782-5126
5	Douglas Co. OEM tcarlini@eastforkfire.org Todd Carlini is Emergency Manager, knowledgeable and helpful w/flood info for Douglas Co.	775-782-9048
6	Carson City OEM sgiomi@carson.org Stacey Giomi is Fire Chief and EM. Monitors gage for flood planning purposes.	775-283-7150
7	Carson City S.O. KFurlong@ci.carson-city.nv.us Ken Furlong is Sheriff, direct phone is 775-887-2020 x41901. S.O. monitors gage for flood planning purposes.	775-887-2500
8	Alpine Co. S.O. jcrawford@alpineso.com John Crawford is Alpine County S.O., knowledgable about flooding in Alpine County.	530-694-2231
9	Lyon Co. SO/OEM aveil@lyon-county.org (Sheriff); jpage@lyon-county.org (EM) Lyon Co Sheriff is Alan Veil; Captain Jeff Page is EM, Office:775-463-6531 OR 6620 X10. Closely monitors Carson River forecasts as has high impact on Lyon Co flooding. Knowledgable about flood impacts in Lyon Co.	775-463-6620
10	Truckee-Carson Irrigation District General: info@tcid.org TCID monitors gage for Lahontan Resv inflow planning. O&M Foreman: Walt Winder, Kate Rutan is TCID Office Manager, Rusty Jardine is TCID Project Manager	775-423-2141
11	National Weather Service NWS electronic technicians are responsible for LARC maintenance. HMTs/SSH responsible for QC of data.	775-673-8107
12	Frontier Phone Repair Site address for repair: 163 Tillman Lane, Gardnerville, NV	877-462-8188

Downstream view from near gage location; 6/22/2005, Stage 5.18', 1160 cfs

Upstream view from near gage location; 6/22/2005, Stage 5.18', 1160 cfs

Horseshoe Bend from above GRDN2 gage location, looking upstream; 6/22/2005, Stage 5.18', 1160 cfs

Horseshoe Bend from above GRDN2 gage location, view upstream. 6/22/2005, Stage 5.18', 1160 cfs

Horseshoe Bend looking downstream; GRDN2 gage just out of photo to left. 6/22/2005, Stage 5.18', 1160 cfs

Horseshoe Bend; gage just out of photo on left. 6/22/2005, Stage 5.18, 1160 cfs

View to W from just W of ridge above Horseshoe Bend toward Mud Lake and Freel-Jobs Peaks. 6/22/2005.